

THE ARIZONA HYDROLOGICAL SOCIETY

NEWSLETTER



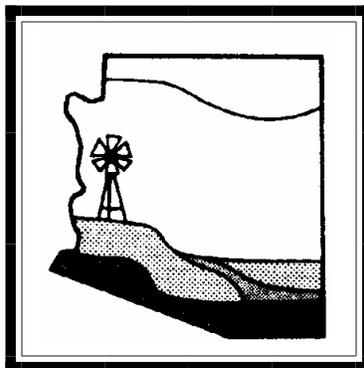
**NOAA REPORTS WET, WARM YEAR FOR THE U.S. IN 2004
HURRICANES, WILDFIRES, DROUGHT, SNOWPACK AND FLOODING ALL NOTABLE**

*The following is a December 16, 2004 National Oceanic and Atmospheric Administration press release. It can be viewed with graphics at <http://www.noaanews.noaa.gov/stories2004/s2355>.
*Htm. LKB**

When 2004 ends, it will rank among the top 10 wettest years on record for the contiguous United States and is expected to be warmer than average, according to scientists at the NOAA Climatic Data Center in Asheville, N.C. The findings are based on preliminary data and historical records dating back to 1895. While parts of the West remained in drought, rainfall was above average in 33 states, especially in the South and East, partly due to the effects of tropical storms and hurricanes, which impacted 20 states.

A Variable Year for Temperature in the U.S.

NOAA scientists report that the average temperature for the contiguous United States for 2004 (based on preliminary data) will likely be approximately 53.5 degrees F (11.9 degrees C), which is 0.7 degrees F (0.4 degrees C) above the 1895-2003 mean, and the 24th warmest year on record. Based on data through the end of November, the mean annual temperature in two states (Washington



and Oregon) is expected to be much above average, with 30 states being above average, 16 contiguous states near average and no state below the long-term mean.

Alaska's annual temperature is expected to be approximately 1.8 degrees F above the 1971-2000 average for 2004, one of the five warmest years for the state, since reliable records began in 1918. Alaska had a record warm summer with a statewide temperature of 4.6 degrees

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WELCOME TO AHS—AND LAST CALL

-by Leilani Bew
Errol L. Montgomery & Associates, Inc.

With the new year, we would like to welcome all of you who are new to AHS and invite you to make the most of your membership. Remember that monthly meetings are generally the second Tuesday of the month for both the Tucson and Phoenix Chapters. Flagstaff has a less predictable schedule, but you can stay in the know by reading this newsletter, visiting our website (www.azhydrosoc.org), or signing up to be included on the AHS email grapevine. To sign up, just send me an email at lbew@elmontgomery.com. While I include Flagstaff announcements in the general AHS grapevine, Nancy Riccio in Flagstaff also sends chapter-

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CAP AWARD FOR WATER RESEARCH ACCEPTING PAPERS

Papers are now being accepted for the CAP Award for Water Research. The first place prize is \$1,000; second place is \$500. Research submitted for this award should focus specifically on water issues that affect Central and Southern Arizona and the Colorado River. Papers can focus on legal, economic, political, environmental, or water management issues, as well as any other issue that might be of interest to CAP or Arizona water users.

This award program is administered jointly by CAP and AHS. The winners will be awarded their prizes at the Annual AHS Symposium in September 2005. Our thanks to Mike Block and Vicki Campo for providing the oversight and guidance for the award.

For complete information, visit http://www.cap-az.com/public/cap_award/index.cfm?test=1&subSection=28



WELCOME CONTINUED FROM PAGE 1

specific reminders, etc. Her email contact is nancy@plateautechcomm.com.

For our returning members, please make sure you renew your membership by the middle of January to ensure continuing newsletter delivery. The folks who need to pay their dues will already have received their friendly reminder cards. From the volume of checks I've gotten in the last week, I can see the cards have been good reminders. Thanks!

Just a couple of things to remember: if you get your newsletter with a blank sheet of paper inserted, don't worry. That means that one of the other chapters had a special flier and your chapter didn't. Because of the rules of bulk mailing, all pieces must weight the same amount. Use your free sheet of paper wisely. Also due to the vagaries of bulk mailing, there are infrequent times when your newsletter delivery may be delayed. Remember that you can always contact me, or any officer, to get meeting information, or visit our website. My contact information is on the back page of every AHS newsletter. Last, but most certainly not least, please think of this newsletter as your forum. If you would like to share your work with us, or if you see an item you think others would be interested in, please send it to me. If copyright issues are satisfied, we reprint interesting pieces from many sources.

All of us wish all of you a very peaceful and healthy 2005 and an enjoyable and beneficial year with AHS.



WEATHER 2004 CONTINUED FROM PAGE 1

F (2.6 degrees C) above the 1971-2000 mean. May, June, July and August were all record breaking for the state. Much of the West Coast also had record or near record temperatures for the summer of 2004. In contrast, much of the remainder of the contiguous U.S. was relatively cool during June-August, including several cities in the Upper Midwest that had afternoon high temperatures in the low 50s during the middle of August.

Spring temperatures across the U.S. were above average in all states, except Florida, which was near normal for the season. Fall was warm across much of the mid-section of the country, but the West remained near average. Winter began relatively warm in November and early December for states from the Upper Midwest to the East Coast.

Hurricanes in South and East

A major feature of the climate in the U.S. in 2004 was the number of landfalling tropical systems. Nine systems affected the U.S. including six hurricanes, three of which were classified as major on the Saffir-Simpson Scale of hurricane intensity. Four of the six hurricanes affected Florida, making it the only state since 1886 to sustain the impact of four hurricanes in one season (Texas also had four hurricanes in 1886). Hurricane Charley in August was the strongest hurricane (category 4 at landfall) to strike the U.S. since Andrew in 1992 and caused an estimated \$14 billion in damage. Hurricanes Frances, Ivan and Jeanne quickly followed Charley in September.

Hurricane Gaston also impacted the U.S. in August making landfall in South Carolina. In total, the hurricane season cost the U.S. an estimated \$42 billion, the most costly season on record. That record has been calculated back to 1900. While there was extensive wind damage in Florida and other coastal locations, flooding was the major impact further inland. Frances impacted the Southeast and southern Appalachians after a wetter-than-average summer, causing millions of dollars in



RECEPTION PLANNED TO HONOR HERMAN BOUWER

-by Beth Proffitt
Transwest Geochem

RECEPTION PLANNED TO HONOR HERMAN BOUWER

-by Beth Proffitt, Transwest Geochem

A reception for Dr. Herman Bouwer will be held on January 22, 2005 from 2:00 to 4:00 P.M. at the Phoenix Desert Botanical Gardens, in the Historic Webster Auditorium. Hors d'oeuvres and refreshments will be provided courtesy of the AHS Corporate Board. There will be a short presentation, in which Dr. Bouwer will receive the Prince Sultan Bin Abdul Aziz International Prize for Water. The address is 1201 N. Galvin Parkway. Please find a map on their website at www.dbg.org.

There is no charge to attend this event, but donations to the Herman Bouwer Intern Scholarship will always be gladly accepted!

Please come celebrate this great honor with Dr. Bouwer!



HONEYBEES DEFY DINO-KILLING "NUCLEAR WINTER"

The following is a press release from the Geological Society of America and can be found at <http://www.geosociety.org>.
LKB

The humble tropical honeybee may challenge the idea that a post-asteroid impact "nuclear winter" was a big player in the decimation of dinosaurs 65 million years ago.

Somehow the tropical honeybee, *Cretotrigona prisca*, survived the end-Cretaceous ex-

tingtion event, despite what many researchers believe was a years-long period of darkness and frigid temperatures caused by sunlight-blocking dust and smoke from the asteroid impact at Chicxulub.

The survival of *C. prisca* is problematic and telling, asserts paleontology graduate student Jacqueline M. Kozisek of the University of New Orleans. Late Cretaceous tropical honeybees preserved in amber are almost identical to their modern relatives, she says. If no modern tropical honeybee could have survived years in the dark and cold without the flowering plants they lived off of, Kozisek reasoned, something must be amiss with the nuclear winter theory.

"It couldn't have been that huge," says Kozisek of the Chicxulub-related temperature drops asserted by other researchers.

Kozisek [presented] her work on Monday, November 8, 2004, at the Geological Society of America annual meeting in Denver.

Modern tropical honeybees have an optimal temperature range of 88 to 93 degrees F (31-34°C) in order to maintain vital metabolic activities, according to entomological research, says Kozisek. That's also the range that's best for their food source: nectar-rich flowering plants. Based on what is known about the Cretaceous climate and modern tropical honeybees, Kozisek estimates that any post-impact winter event could not have dropped temperatures more than 4 to 13 degrees F (2-7 °C) without wiping out the bees. Current nuclear winter theories from the Chicxulub im-

pact estimate drops of 13 to 22 degrees F (7-12 °C) — too cold for tropical honeybees.

"I'm not trying to say an asteroid impact didn't happen," says Kozisek. "I'm just trying to narrow down the effects."

To do this, Kozisek took a novel approach for a paleontologist — instead of looking at what died out, she dug through the literature to find out what survived the massive extinction event. "I made a list of all survivors and picked those with strict survival requirements," said Kozisek. She determined what those survival requirements were by calling on studies of the closest modern analogues — which wasn't always easy for some species, she pointed out. There was, for instance, a very early primate that crawled out of the Cretaceous alive, but there is really no comparable small primate around today with which to reliably compare, she said.

On the other hand, a good number of tropical honeybees haven't changed a lot in 65 million years and a great deal is known about modern tropical honeybees' tolerances to heat and cold. What's more, amber-preserved specimens of the oldest tropical honey bee, *Cretotrigona prisca*, are almost indistinguishable from — and are probably the ancestors of — some modern tropical honeybees like *Dactylurina*, according to other studies cited by Kozisek.

Her work is published as:
Survival and Its Implications: Tropical Honeybees (Hymenoptera: Apidae: Meliponini) and the Cretaceous-Tertiary Boundary 

CHAPTER NEWS



FLAGSTAFF

-by Nancy Riccio
Plateau TechComm / Plateau
MediaWorks

DECEMBER MEETING SUMMARY

The Flagstaff Chapter met on December 9 to celebrate the holidays, elect new officers, and continue planning for the 2005 AHS Symposium.

JANUARY MEETING

Thursday, January 27, 2005

Time: 4:00 PM

**Location: Geology Building at
NAU, Room 103**

On January 27, Dr. Kip Solomon of the University of Utah will be presenting the 2005 Darcy Distinguished Lecture of the National Ground Water Association. The talk will be held in room 103 of the Geology Building at NAU.

Dr. Solomon has a Ph.D. in earth sciences from the University of Waterloo, an M.S. in geology from the University of Utah, and a B.S. in geological engineering from the University of Utah. Since 1993, he has worked at the Department of Geology and Geophysics at the University of Utah, where he is currently a professor and Director of the Noble Gas Laboratory. Solomon has served on the National Research Council's Committee on Improving Practices for Regulating and Managing Low-Activity Radioactive Waste since 2003. The currently vice-

president-elect of the Hydrology Division of the Geological Society of America (GSA), he served on the editorial board for Ground Water from 1997 to 2001, and was the Joint Technical Program Chair for the GSA's annual meeting in 1997.

NEW OFFICERS FOR 2005

Richard Brose (Four Corners Environmental) will be stepping down from the presidential podium after several years of dedicated service. He will be replaced by Dr. Aregai Teclé (NAU), who served as Vice President during much of 2004. Nancy Riccio (Plateau TechComm) is the newly elected Vice President. Don Bills (U.S. Geological Survey) will continue as Chapter Secretary / Treasurer. We extend our thanks to the 2004 officers for all their hard work.

SYMPOSIUM PLANNING

For progress on symposium planning, please see the article on page 6.

Next Symposium Planning Meeting

Our next meeting will be held on February 2, 2005, at 5:30 PM, at the office of Plateau TechComm (Nancy Riccio), 119 East Terrace Avenue, Suite C, Flagstaff. We'll send an email reminder a few days beforehand. ☐

If there were in the world today any large number of people who desired their own happiness more than they desired the unhappiness of others, we could have paradise in a few years.

Bertrand Russell (1872 - 1970)



PHOENIX

-by Lee-Anna Walker
Archaeological Consulting Services, Ltd.

DECEMBER MEETING SUMMARY

On December 14, Mark Raming of SWCA spoke to the Phoenix Chapter on the topic, "Do We Need To Learn To Live With Drought?"

The southwestern U.S. has been in a drought for the past five to eight years, creating a 21 inch rainfall deficit in Arizona. Dramatically reduced lake levels can be seen at Lake Powell, and it is estimated that Lake Powell is only two years away from "dead pool" levels. Unfortunately, rainfall predictions show limited improvement for water shortages.

Historically and prehistorically severe droughts have been identified utilizing numerous paleoenvironmental datasets. In the 16th century, a region in central Mexico increased taxes because crops were flourishing under wetter climatic conditions. Not surprisingly, this time of abundance was followed by a 22-year long drought when the higher taxes couldn't be paid. Another political decision was made under similar environmental conditions for Colorado River water rights. Again, the decisions were based upon wetter environmental conditions could not be upheld during periods of drought.

Climatic models are being developed to help plan for future environmental changes. Tree

CHAPTER NEWS



PHOENIX NEWS CONTINUED FROM PAGE 4

rings, paleotemperatures, Milankovich Cycles, oceanic conveyor belt shifts, and other data are being examined to help develop predictive models. Many environmental groups believe that greenhouse gases are major contributors to global warming. However, there are many non-human factors that have also contributed to major climatic changes in the past. There doesn't appear to be one sole factor driving environmental change. We know that global temperatures are increasing and the ice cover is decreasing. Greenhouse gases are not the sole causative agents in climate change and that increasing temperatures will ultimately trigger global cooling and vice versa. These climatic changes can happen at a faster timescale than we think, even at a decadal scale. Unfortunately, there are no accurate models currently available to predict long-term precipitation and temperatures for planning purposes. We can, however, start making politically important decisions based upon a wider range of environmental data instead of short-term conditions that can, and likely will, dramatically change in the future.

JANUARY ANNUAL KICK-OFF MEETING ANNOUNCEMENT

Friday, January 14, 2005

Time: 6:00 PM

Location:
Keith Scoular's House
1017 E. El Freda Road

Go up Rural, Turn east on to El Freda Road (located between Warner and Elliot). Their house is located 2 blocks east of Rural in the Buena Vista Ranchos subdivision, directly south of the community's park.

Cost: Free!!! Food and beverages will be provided.

Please RSVP by Friday, January 7 to Beth Proffitt by phone at (602) 437-0330 or by email at: eproffitt@transgeo.com.

Please join the Phoenix Chapter as we plan activities for 2005 and have a good time. Listed below is a tentative line-up for the coming year. Come add our 2 cents worth!

FUTURE SPEAKERS/ TENTATIVE SCHEDULE FOR 2005

February – Colorado River Boundary determination, Pat Quinn & Mike Kellogg, JE Fuller/Hydrology & Geomorphology, Inc.

March – Mars, Dr. Phil Christensen, ASU

April – CAP Canal hydraulic operations, Patrick Dent, CAP
May – Dam Safety rehabilitation program efforts in Maricopa County, Brett Howey, FCDMC; also tentative field trip to rehab construction site

June – Water re-use in Mesa, Karen Sorenson, City of Mesa

July – Agua Fria linear recharge project, Frank Turek, PBSJ

August – Off

September – AHS Symposium

October – Tempe Town Lake, Basil Boyd, City of Tempe

November – Dr. Stephen Reynolds, Geowall, at ASU

December – Lynne Fisher, USBR

2005 PHOENIX CHAPTER ELECTION RESULTS

38 ballots were received and tallied.

**President: Ted Lehman
Vice President:**

Chris Shepherd

Treasurer: Beth Proffitt

Secretary: Lee-Anna Walker

**Board Members: Basil Boyd
and Matt Frailey**

**Phoenix Corporate Board
Member: Peter Kroopnick** ☐



TUCSON

DECEMBER MEETING SUMMARY

Please look for a summary of the December meeting in next month's newsletter.

JANUARY MEETING

Tuesday, January 11, 2005

Time:

7:00 PM Social Half Hour

7:30 PM Presentation

Location: U of A Campus
Marshall Building, Room 539
845 N. Park

Topic: "First water from the Colorado River: An analysis of the hydrologic and geochemical evolution of an early Pliocene chain of lakes in the lower Colorado River valley" presented by Jon Spencer, Arizona Geological Society

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**TUCSON NEWS
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Jon Spencer, of the AZGS, will be presenting a talk on the early evolution of the lower Colorado River.

The meeting will be held at the Marshall Building on the UA campus, located at 845 N. Park, in the 5th floor conference room 539. The doors to the building will be unlocked and the elevator will go to the 5th floor only, so guests should have no trouble getting in.

LOOKING AHEAD...

Our February speaker will be Ralph Marra from Tucson Water. He will be speaking about the Tucson Water Resource Plan, on Tuesday evening, February 8. Watch for more details in next month's issue.

**2005 TUCSON CHAPTER
ELECTION RESULTS**

- President: Bill Petroustson,** AMEC Earth & Environmental
- Vice President: Anne Huth,** ARC Solutions
- Treasurer: Ken Carroll,** Water Management Consultants
- Secretary: Phil Bredfeldt,** Clear Creek Associates
- Board Members: Mike Block,** Metro Water
- Chapter Director: Marla Odom** Errol L. Montgomery & Associates, Inc.
- Student Director: Tasha Lewis,** University of Arizona



**SYMPOSIUM 2005
PLANNING UPDATE**

-by Nancy Riccio
Plateau TechComm / Plateau MediaWorks

On December 9, Flagstaff Chapter members continued

discussing issues related to venue, format, and speakers. The next symposium will be held at the Radisson in Flagstaff pending confirmation and approval (the Hilton in the Sedona area was ruled out because of scheduling conflicts). We are considering structuring the symposium so that the first full day features plenary and/or panel sessions and the second day features concurrent breakout sessions until mid-afternoon. Don Bills will present a preliminary budget at the January Corporate Board meeting for approval.

- Working theme: Water Resources, Drought, and Ecosystem Management

- Executive Committee: Richard Brose, Jim Janecek, Don Bills
- Treasurer: Don Bills

Subcommittees

- Technical Sessions: Margot Truini / Nancy Hornewer (Co-Chairs); Aregai Tecele, Richard Brose-
- Technical Workshops: Paul Guamillion (Chair), Abe Springer
- Poster Sessions: Bob Hart (Chair)
- Speakers: Aregai Tecele (Chair), Don Bills, Abe Springer
- Fundraising / Exhibitors: Richard Brose (Chair)
- Proceedings: Nancy Riccio (Chair)
- Mailings: Paul Whitefield (Chair)
- Field Trips: Abe Springer (Chair), Jim Janecek, Paul Guamillion, Erin Young
- Hotel / Food / Entertainment: Richard Brose (Chair), Jacob

Miller (Cubbie), Nancy Riccio, Don Bills

- Audio-Visual: Abe Springer (Chair), Bob Hart
- Student Outreach: Aregai Tecele / Paul Guamillion (Co-Chairs), Erin Young, Cubbie

All members are invited to participate in this process. Our next meeting will be held on February 2, 2005, at 5:30 PM, at the office of Plateau TechComm (Nancy Riccio), 119 East Terrace Avenue, Suite C, Flagstaff. ☐



**UHLMAN APPOINTED
TO WPF COMMISSION**

Governor Janet Napolitano has appointed [AHS's own] Kristine Uhlman to the Water Protection Fund Commission for a 3-year term. The Arizona Water Protection Fund was established in 1994 by the Arizona State Legislature. The Fund is overseen by the Arizona Water Protection Fund Commission, comprised of 15 members of the public, and funds projects based on a competitive grants process. Commissioners represent a variety of land, water use, and riparian issue perspectives. The Fund is here to provide funding for maintaining, enhancing, and restoring rivers, streams, and riparian habitat. Further information can be found at www.awpf.state.az.us.

Kristine Uhlman is the State-wide Coordinator for the NEMO, Nonpoint Source Education for Municipal Officials, an outreach education partnership between the University of Arizona Cooperative Extension and the Arizona Department of Environmental Quality. The NEMO program provides water education to land-use decision makers,


**UHLMAN CONTINUED FROM
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municipalities, and other stakeholders to restore, maintain, and protect water quality and quantity across the state of Arizona.

The first woman to graduate from the Hydrology program at the UofA (1974), Kristine also holds a Masters in Civil Engineering from Ohio State. She brings over 28 years of experience in the position, having worked with the USGS on mine-site restoration, the New York State Attorney General's litigation at the Love Canal, as well as several domestic and international consulting firms. ☐


**WEATHER 2004 CONTINUED
FROM PAGE 2**

flood damage to the region. Shortly thereafter Ivan traveled a similar path through the mountains and led to widespread flooding, loss of power and landslides.

Drought and Snowpack

In contrast to the excessive rainfall in the East, much of the West began the year with a long-term rainfall deficit. A four-to-five-year drought in parts of the West intensified during the first half of 2004 as precipitation remained below average. Drier-than-average summer conditions coupled with warmer than normal temperatures in the West exacerbated the drought conditions still further during June-August. Short-term drought relief occurred in the fall as two large storms impacted the West during October. The first major snowfall of the season was associated with these storms for the Sierra Nevada. As of early December, snowpack is above average in Utah,

Arizona and Nevada but significantly below average throughout much of the Northwest as well as the eastern slope of the Rockies. Near year's end, moderate to extreme drought continued to affect large parts of the West, including Montana, Idaho, Washington, Oregon, Wyoming, California, Arizona and Colorado.

Wildfires

Although the wildfire season got an early start in the western U.S., and record warm temperatures combined with less-than-average precipitation raised fire danger across the West through the summer, the season concluded as below average for the contiguous U.S. However, a record number of acres were burned in Alaska in 2004.

Alaska and the adjacent Yukon Territory of Canada saw a rapid increase in fire activity in June, which was sustained through August consuming more than 6.6 million acres in Alaska. In Fairbanks, on 42 of the 92 days of summer, visibility was reduced from smoke associated with the wildfires. This compares to the previous record of 19 days in 1977.

Global Conditions

The average global temperature anomaly for combined land and ocean surfaces from January-December 2004 (based on preliminary data) is expected to be 0.55 degrees F (0.31 degrees C) above the 1880-2003 long-term mean, making 2004 the 4th warmest year since 1880 (the beginning of reliable instrumental records). Averaged over the year, land surface temperatures were anomalously warm throughout western North America, southern and western Asia and Europe. Boreal fall

(September-November) as well as November were warmest on record for combined land and ocean surfaces.

Other notable climate events and anomalies across the world in 2004 include an active tropical season in the Northwest Pacific with Japan sustaining ten tropical storm landfalls, exceeding the previous record of six; below normal monsoon rainfall for India, especially in the Northwest part of the country; flooding in Northeastern India from monsoon rains in June-October; a rare hurricane in the South Atlantic in March; and an extensive and severe heat wave in Australia during February.

Sea surface temperatures in much of the central and east-central equatorial Pacific increased during the latter half of 2004 as weak El Niño conditions developed. Though global impacts have been slow to develop, the NOAA Climate Prediction Center expects the current El Niño to persist through early 2005, bringing drier-than-average conditions to Indonesia, northern Australia and south-eastern Africa.

The National Climatic Data Center is part of the NOAA Satellites and Information Service, America's primary source of space-based oceanographic, meteorological and climate data. The NOAA Satellites and Information Service operates the nation's environmental satellites, which are used for ocean and weather observation and forecasting, climate monitoring, and other environmental applications. Some of the oceanographic applications include sea surface temperature for hurricane and weather forecasting and sea surface heights for El Niño pre-



GET READY FOR THE LARGEST DEMOLITION DERBY ON THE PLANET

The following is a NASA press release. More information and video clips can be viewed at http://www.nasa.gov/vision/earth/lookingatearth/ice_berg_ram.html. LKB

NASA satellites have witnessed a 100-mile-long iceberg near McMurdo Research station move like a battering ram toward Drygalski Ice Tongue. "It's a clash of the titans, a radical and uncommon event," says Robert Bindshadler, a researcher at NASA's Goddard Space Flight Center, and if the two giant slabs of ice collide, we could see one of the best demolition derbies on the planet.

When the iceberg and the ice tongue collide, the impact will likely "dent their bumpers," says Bindshadler. The edges could crumple and ice could pile or drift into the Ross Sea. But if the B-15A iceberg picks up enough speed before the two collide, the results could be more spectacular. The Drygalski Ice Tongue could break off.

The ice tongue is thick ice that grows out over the Ross Sea from a land-based glacier on Antarctica's Scott Coast. "Ice tongues do break off on occasion," says Bindshadler. "It would only take one thin area on the ice tongue to make it break off." There's no guarantee that the Drygalski Ice Tongue will break off, but "this is the toughest blow it has ever had to deal with."

"That Ice tongue has no reason for staying intact" says Waleed Abdalati, researcher with NASA's Goddard Space Flight

Center, but Bindshadler points out, it may not break up either. The results depend on the movement of the B-15A iceberg.

The B-15A iceberg is a 3,000-square-kilometer (1,200-square-mile) behemoth that has a history of causing problems. It is the largest fragment of a much larger iceberg that broke away from the Ross Ice Shelf in March 2000. Scientists believe that the enormous piece of ice broke away as part of a long-term natural cycle (every 50-to-100 years, or so) in which the shelf, which is roughly the size of Texas, sheds pieces much as human fingernails grow and break off.

The berg initially drifted toward McMurdo Sound and grounded near Cape Crozier on Ross Island. It has since broken into pieces, the largest of which is B-15A.

This year, B-15A has trapped sea ice in McMurdo Sound. The currents that normally break the ice into pieces and sweep it out into the Ross Sea have not been able to clean out the Sound, so winter's thick ice remains intact.

The build-up of ice presents significant problems for Antarctic residents. Penguins must now swim great distances to reach open waters and food. Adult penguins may not be able to make the trip and return with food for their young. As a result, many chicks could starve, says Antarctica New Zealand, the government organization that oversees New Zealand's Antarctic research, in the Associated Press.

The National Science Foundation (NSF) officials said that the

B-15A iceberg and the frozen Sound will not interfere with supply ship access to McMurdo Station, the U.S. logistics hub for much of the nation's research activity in Antarctica. The U.S. Coast Guard icebreaker Polar Star left Seattle, Washington, on November 4 and should reach the edge of the sea ice around December 27. It will begin immediately to cut a channel in the sea ice for the supply ships. Ironically, a collision between the iceberg and the ice tongue could make things easier for both penguins and ships. If the ice tongue collapses, the way may be opened for sea ice to escape the Sound.

There is no guarantee that satellites will see a great demolition because the berg's fate is unclear. The berg's future depends on unpredictable winds, tides and other forces, but possibilities include colliding with the floating Drygalski Ice Tongue, or continuing north, eventually melting. If the collision happens, the impact could come as soon as December 24.

If the collision occurs as predicted, this could be an event that we witness again and again. The tides that drive the iceberg's motion tend to push it in circles. "If B-15A bangs the ice tongue once, it could bang it again," says Bindshadler. With multiple daily views of the Ross Sea, NASA satellites will be there to watch the show. ☐



AIPG MEETINGS TO BE HELD IN CONJUNCTION WITH GEM & MINERAL SHOW IN TUCSON

The AIPG AZ Section February 2005 meeting will be held in conjunction with the Tucson


**AIPG CONTINUED FROM
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Gem and Mineral Show AND with the AIPG National Executive Board (NEB) meeting. The NEB will be meeting all day on Friday, February 11, at the Radisson Hotel in downtown Tucson. All members are invited to attend the board meetings, which will be held from 9:00 AM — 3:00 PM. AIPG National also will have a booth at the Convention Center for four days of the Tucson Gem and Mineral Show (TGMS) (Thursday through Sunday, February 10-13).

Other activities include a section dinner at El Parador restaurant on Friday evening, February 11. There will be an AIPG AZ Section business meeting at 9:00 AM on Saturday, February 12, 2005, at the Arizona Geological Survey office. AGS is located at 416 West Congress, Suite 100. Members and guests are invited to arrive at 8:30 AM for socializing over coffee, fruit juices, and donuts. Following the business meeting, we will have a guided "behind the scenes" tour of the TGMS. For more details, please visit: <http://www.aipg.org/StaticContent/anonymous/enewsletter/aipgnewsletter.tm>.


**EMPLOYMENT
OPPORTUNITIES**
**JOB OPENINGS, IMMEDIATE,
LAS VEGAS AREA**

Up and coming environmental consulting and cleanup firm in the Las Vegas area is looking for experienced, ambitious, quality-oriented staff. Our client base is mixed Federal, local, and private.

Environmental Scientist

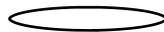
Seeking motivated person of scientific background (environmental, geology, or hydrology focus preferred). Relevant professional certification a plus. Hazwoper training preferred. Successful applicant will plan and execute field activities, and produce reports for site investigation, multimedia sampling events, and remediation projects, under the oversight of a Nevada Certified Environmental Manager. We value a sound work ethic, finesse in agency/client diplomacy, and excellence in customer service.

Hazmat Technician

Seeking a skilled jack-or-jill-of-all-trades with experience in sampling, monitoring, hazmat control and cleanup, waste profiling, and associated EPA/DOT/OSHA regulations. Basic mechanical, electrical, plumbing skills a plus. Current Hazwoper certification required. We are leaders in safety and customer service; "cowboys" need not apply.

Please send a letter of interest and current resume to:

Zenitech Environmental, LLC
Attn: Ms. Monica Monteros,
Principal
764 Fairway Dr.
Boulder City, NV 89005
fax: (702) 293-0141
web: www.zenenv.com



Errol L. Montgomery & Associates, Inc. is currently seeking a mid-level hydrogeologist or hydrologist for its Phoenix office.

The ideal candidate would have the following qualifications:

- Strong technical background in hydrogeology

- Experience in well drilling supervision and drill cuttings description, borehole geophysical logging, pumping test design and coordination, soil and water sampling, and groundwater monitoring

- Project coordination and report writing skills

- Professional registration, or desire to obtain registration

- Experience with GIS software, groundwater flow modeling, permitting, electronic dataloggers, remote sensing, isotope analysis, and/or prior experience in consulting preferable but not required

The position may include considerable field work and travel from the office. Compensation will be commensurate with experience and skills. For information on Errol L. Montgomery & Associates, please visit www.elmontgomery.com.

Please submit letters of interest and resumes in Word format via fax at (480) 948-7747, or via email to Dennis Shirley at dshirley@elmontgomery.com.

All inquiries and resumes are confidential.

2005 MEMBERSHIP DUES

Dues, payable to AHS (\$40.00, \$15.00 for students) should be sent to:

Leilani Bew, AHS Newsletter Editor
 Errol L. Montgomery & Associates, Inc.
 1550 East Prince Road
 Tucson, Arizona 85719
 Phone: (520) 881-4912
 Or pay online at www.AzHydroSoc.org

ARIZONA HYDROLOGICAL SOCIETY
Newsletter Department
Leilani Bew
c/o Errol L. Montgomery & Associates, Inc.
1550 East Prince Road
Tucson, Arizona 85719

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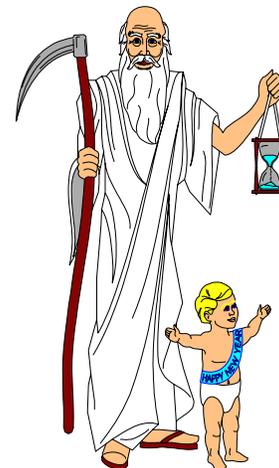
ADDRESS SERVICE REQUESTED

AHS NEWSLETTER SUBMITTALS

Submittals and comments should be addressed and faxed to Leilani Bew at Errol L. Montgomery & Associates, Inc. by the **15th** of each month. If you learn of something timely after the deadline has passed, call me, and we can discuss it.

Phone : (520) 881-4912
FAX: (520) 881-1609
E-mail: lbew@elmontgomery.com

Thanks are extended to Errol L. Montgomery & Associates, Inc. for their donation of phones, fax, computers, and staff to support publication of this newsletter.



Welcome 2005!

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MANY THANKS EVERYONE

Check page 3 for details on the luncheon for Dr. Herman Bouwer



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